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10/682,143	10/09/2003	Ross Bradsen	1766-000001	1346

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EXAMINER	
TRIEU, THAI BA	
ART UNIT	**PAPER NUMBER**
3748	

DATE MAILED: 07/07/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

Office Action Summary	**Application No.** 10/682,143	**Applicant(s)** BRADSEN, ROSS
	Examiner Thai-Ba Trieu	**Art Unit** 3748

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-43* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3-11,14-16,18-26,29,30,32-37 and 40-43* is/are rejected.

7)☒ Claim(s) *2,12,13,17,27,28,31,38 and 39* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *19 April 2004* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Drawings

The drawings are objected to under 37 CFR 1.83(a) because they fail to show ***"94"*** (See Pages 8-9, Paragraph [0036], line 8) as described in the specification. Any structural detail that is essential for a proper understanding of the disclosed invention should be shown in the drawing. MPEP § 608.02(d). Corrected drawing sheets are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

2. Applicant(s) is/are required of shading the ***"body of the piston"*** with the shading scheme, which represents a **porous metal material** (See MPEP § 608.02)

Specification

The disclosure is objected to because of the following informalities:

- On Page 30, Paragraph [0094], line 2, ***"axle shaft 184"*** should be replaced by -- **axle shaft 186** -- *(for correcting typo error).*
- On Pages 30-31, Paragraph [0095], line 17, ***"seal 186"*** should be replaced by -- **seal 188** -- *(for correcting typo error).*

Appropriate correction is required.

Claim Objections

Claims 2 and 41 are objected to because of the following informalities:

- In claim 2, line 5, ***"said pin"*** before ***"engages"*** should be replaced by -- **said first pin** -- (for consistency of claims).
- In claim 41, line 1, ***"claim 13"*** should be replaced by -- **claim 15** -- (for correcting typo error).

Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 3-11, 15-16, 18-26, 29-30, 32-37, 40 and 42 are rejected under 35 U.S.C. 102(b) as best understood as being anticipated by Waldrum (Patent Number 3,765,378).

Regarding claims 1 and 3-11, Waldrum discloses an apparatus comprising:

a housing (20) (See Figure 4);

a first disc (24, 26) rotatably disposed with respect to said housing, said first disc (24, 26) defining a slot (210) (See Figure 4);

a second disc (30) rotatably disposed with respect to said housing; and a first pin (32, 40, 48) mounted to said second disc (30) (See Figure 4);

wherein rotation of said first and second discs (24, 26, 30) with respect to said housing causes said first pin (32, 40, 48) to engage said slot (210) to define a first compression chamber between said first pin (32, 40, 48) and said first disc (24, 26) (See Figure 4, Column 2, lines 42-68, and Column 5, lines 5-14);

wherein said first disc (24, 26) defines a tunnel (212, 214) in communication with said slot (210) (See Figure 4);

a fuel injector disposed within said tunnel (212, 214) (See Figures 1-2 and 4, Column 4, lines 47-61, and Column 5, lines 14-22);

said fuel injector is disposed along an axis of rotation of said first disc (24,26) (See Figures 1-2 and 4, Column 4, lines 47-61, and Column 5, lines 14-22);

wherein said injector is rotatably disposed with respect to said first disc (24, 26) (See Figures 1-2 and 4, Column 4, lines 47-61, and Column 5, lines 14-22);

wherein said fuel injector is movable between a first position and a second position, said fuel injector spraying fuel to a first location when in said first position, said fuel injector spraying fuel to a second location when in said second position, said second position being different than said first position (See Figures 1-2 and 4, Column 4, lines 47-61, and Column 5, lines 14-22). And

a spark initiator (68) in communication with said first combustion chamber (See Figure 3);

a fuel injector in communication with said first combustion chamber (210) (See Figure 4, Column 5, lines 45-68, Columns 6-8, lines 1-68, and Column 9, lines 1-14).

Regarding claims 15-16 and 18-26, Waldrum discloses an apparatus comprising:

a housing (20) (See Figure 4);

a first disc (24, 26) rotatably disposed with respect to said housing, said first disc (24,26) defining a first and a second slot (210) (See Figure 4);

a second disc (30) rotatably disposed with respect to said housing; and

a first and second pin (32,40,48) mounted to said second disc (30) (See Figure 4);

wherein rotation of said first and second discs (24, 26, 30) with respect to said housing causes said first pin (32, 40, 48) to engage said first slot (210) to define a first compression chamber between said first pin (32, 40, 48) and said first disc (24, 26), and said second pin (32, 40, 48) to engage said second slot to define a second compression chamber between said second pin (32, 40, 48) and said first disc (24, 26) (See Figure 4, Column 2, lines 42-68, and Column 5, lines 5-14);

wherein said first and second slots (210) are disposed opposite to each other (See Figure 4);

wherein said first disc (24, 26) defines a tunnel (212, 214) in communication with said first and second slots (210) (See Figure 4);

a fuel injector disposed within said tunnel (212, 214) (See Figures 1-2 and 4, Column 4, lines 47-61, and Column 5, lines 14-22);

wherein said fuel injector is disposed along an axis of rotation of said first disc (24, 26) (See Figures 1-2 and 4, Column 4, lines 47-61, and Column 5, lines 14-22);

wherein said injector is rotatably disposed with respect to said first disc (24, 26) (See Figures 1-2 and 4, Column 4, lines 47-61, and Column 5, lines 14-22);

wherein said fuel injector is movable between a first position and a second position, said fuel injector spraying fuel to a first location when in said first position, said fuel injector spraying fuel to a second location when in said second position, said second position being different than said first position (See Figures 1-2 and 4, Column 4, lines 47-61, and Column 5, lines 14-22);

spark initiator (68) in communication comprising a first with said first compression chamber and a second spark initiator in communication with said second compression chamber (See Figure 3);

a fuel injector in communication with said combustion chamber (210) (See Figure 4, Column 5, lines 45-68, Columns 6-8, lines 1-68, and Column 9, lines 1-14); and

a first spark initiator (68) in communication with said first compression chamber and a second spark initiator (68) in communication with said second compression chamber (See Figure 3).

Regarding claims 29-30, 32-37 and 40, Waldrum further discloses

said first disc (24, 26) defines a third and fourth slot (210) (See Figure 4);

a third and fourth pin (32, 40, 48) are mounted to said second disc (30);

rotation of said first (24,26) and second (30) discs with respect to said housing causes said third pin (32, 40, 48) to engage said third slot (210) to define a third compression chamber between said third pin and said first disc, and said fourth pin to engage said fourth slot to define a fourth compression chamber between said fourth pin and said first disc (See Figure 4);

wherein said first and second slots (210) are disposed opposite to each other and said third and fourth slots are disposed opposite to each other (See Figure 4);

wherein said first disc (24, 26) defines a first tunnel (212,214) in communication with said first and second slots (210) and a second tunnel (212, 214) in communication with said third and fourth slots (210) (See Figure 4);

a first fuel injector (via 212, 214) disposed within said first tunnel and a second fuel injector disposed within said second tunnel (See Figures 1-2 and 4, Column 4, lines 47-61, and Column 5, lines 14-22);

wherein said first and second fuel injectors are disposed along an axis of rotation of said first disc (24, 26) on opposite sides of said first disc (24, 26) (See Figures 1-2 and 4, Column 4, lines 47-61, and Column 5, lines 14-22);

wherein said first and second fuel injectors are rotatably disposed with respect to said first disc (24, 26) (See Figures 1-2 and 4, Column 4, lines 47-61, and Column 5, lines 14-22);

wherein each fuel injector (via 212, 214) is movable between a first position and second position, each fuel injector spraying fuel to a first location when in said first position and each fuel injector spraying fuel to a second location when in said second position, said second position being different than said first position (See Figures 1-2 and 4, Column 4, lines 47-61, and Column 5, lines 14-22);

wherein each combustion chamber (210) is in communication with a spark initiator (68) (See Figure 3).

Regarding claim 42, Waldrum discloses an internal combustion engine comprising:

a housing (20) defining a combustion chamber (210) (See Figure 4);

a fuel injector (212, 214) in communication with said combustion chamber (210), said fuel injector being movable between a first and a second position, said fuel injector spraying fuel to a first location when in said first position, and said fuel injector spraying fuel to a second location when in said second position, said second position being different than said first position (See Figures 1-2 and 4, Column 4, lines 47-61, and Column 5, lines 14-22);

Claim 42 is rejected under 35 U.S.C. 102(b) as best understood as being anticipated by Demopoulos (Patent Number 4,571,946).

Demopoulos discloses an internal combustion engine comprising:

a housing defining a combustion chamber (11) (See Figure 1);

a fuel injector (65) in communication with said combustion chamber (11), said fuel injector being movable between a first and a second position, said fuel injector spraying fuel to a first location when in said first position, and said fuel injector spraying fuel to a second location when in said second position, said second position being different than said first position (See Figures 1 , 4, and 8; Column 4, lines 41-46, and Column 6, lines 21-26).

Claim 43 is rejected under 35 U.S.C. 102(b) as best understood as being anticipated by Hamajima et al. (Patent Number 4,712,600).

Hamajima discloses a piston for an engine, said piston comprising:

a body (1) comprised of a porous metal (See Figures 1 and 8); and

a cavity (4) defined by said body (See Figures 1 and 8, Column 1, lines 5-10, Column 9, lines 56-68, Columns 10-12, lines 1-68, and Column 13, lines 1-24).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 14 and 41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Waldrum (Patent Number 3,765,378), in view of Burk (Patent Number 4,615,171).

Waldrum discloses the invention as recited above; however, Waldrum fails to disclose the pins being of porous metal.

Burk teaches that it is conventional in the connection/link art, to utilize the porous metal pins (46) (See Figure 6, Column 1, lines 54-56, and Column 3, lines 37-41).

It would has been obvious to one having ordinary skill in the art at that time the invention was made, to have utilized the porous metal pins, as taught by Burk, to improve the performance and efficiency of the Waldrum device.

Allowable Subject Matter

Claims ***2, 12-13, 17, 27-28, 31, and 38-39*** are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- Hajet (US Patent Number 3,117,562) discloses a rotary gear type internal combustion engine.
- Jones (US Patent Number 985,907) discloses a rotary internal combustion engine.
- Savoie, Jr. (US Patent Number 3,472,210) discloses a synchronized counter rotary engine.

- Lee (US Patent Number 3,865,086) discloses a rotary internal combustion engine.

- Lee (US Patent Number 4,274,374) discloses an air-cooled rotary internal combustion engine.

- Shobert (US Patent Number 4,976,550) discloses an expanded fiber reinforced bearing.

- Kawamura (Patent Number JP 07233727 A) discloses a structure of a combustion chamber providing an auxiliary chamber made of porous metal and communication hole being arranged in a piston head member.

- Fukuda et al. (Patent Number JP 54151715 A) disclose a combustion chamber for an internal combustion engine having the contact surface of a piston being coated with porous metal of nickel, or iron alloy, or the like.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thai-Ba Trieu whose telephone number is (703) 308-6450. The examiner can normally be reached on Monday - Thursday (6:30-5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas E. Denion can be reached on (703) 308-2623. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR.

Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Thai-Ba Trieu
Patent Examiner
Art Unit 3748

TTB
July 5, 2004